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In 2014, a Danish swine herd with confirmed swine influenza virus diagnosis had persistent problems with respiratory disease in pigs and reproductive problems in sows, despite vaccination against swine influenza. Subtyping by sequencing of the influenza virus revealed that it contained an HA that was most closely related to human seasonal influenza from 2004/05 and an NA closely related to contemporary swine N2 influenza A viruses. These findings led to further investigation of the occurrence of the new virus strain denoted H3huN2sw, in Danish swine herds.An H3hu-specific real-time RT-PCR was developed and used for screening of samples submitted to the National Veterinary Institute for SIV diagnostic purposes and the H3huN2sw virus was found in several farms in Denmark. Most samples contained H3 of 2004/5 origin, but more recent H3 introductions were also revealed.All positive samples were inoculated on MDCK cells and if no growth were observed, the sample underwent serial passage in embryonated chicken eggs. Haemagglutination inhibition test against hyperimmune sera of pigs vaccinated with a commercial swine influenza vaccine available in Denmark was performed to investigate vaccine effectiveness.The zoonotic potential of this novel virus was assessed in the ferret transmission model.
Three ferrets were inoculated with an H3huN2sw isolate and housed in separate cages, each together with a naive ferret to study direct transmission. In adjacent cages were three additional ferrets housed to study aerosol transmission. HI testing revealed that there was no cross-reactivity of the vaccine antisera to the H3huN2sw. The ferret experiment revealed that the virus was readily transmitted to contact animals, but that no aerosol transfer was observed. The H3huN2sw circulating in Danish herds seems to cause more pronounced disease in pigs than other circulating SIVs. Furthermore, there is no vaccine available at the moment to control the infection with devastating consequences for swine health. Moreover, the ferret studies showed that the H3huN2sw can infect ferrets by direct contact and by that may be a potential zoonotic threat.